

Patent Claims

1. Apparatus for joining together at least two substrates (2,3), each of which has an inner hole, with a pin (1,50) that is adapted to the inner holes of the substrates, characterized in that the pin is provided with at least two noses (10,51) that are movable radially relative to the pin (1,50), wherein the edges of the inner holes of the substrates glide downwardly upon the linear outer surfaces of the noses during movement of the noses (10,51) toward the pin (1,50).
2. Apparatus according to claim 1, characterized in that the noses (10,51) hold the substrates (2,3) spaced apart prior to the joining together.
3. Apparatus according to claim 1 or 2, characterized in that the pin (1,50) is a centering pin.
4. Apparatus according to one of the preceding claims, characterized in that the noses (10,51) are pivotably mounted on the centering pin.
5. Apparatus according to one of the preceding claims, characterized by at least one biasing unit (12,56) for the biasing of the noses (10,51) outwardly.

6. Apparatus according to claim 5, characterized in that the biasing unit has at least one spring (12,56).
7. Apparatus according to one of the preceding claims, characterized in that the noses (10,51) are movable toward the pin (1,50) by exerting pressure upon the substrates (2,3).
8. Apparatus according to one of the preceding claims, characterized by an actuating element (13,78) that radially moves the noses (10,51).
9. Apparatus according to one of the preceding claims, characterized in that the noses (51) are embodied as lever arms.
10. Apparatus according to claim 8 or 9, characterized in that the actuating element (78) is introducible between the noses (51).
11. Apparatus according to one of the claims 8 to 10, characterized in that the actuating element (13,78) is conical.
12. Apparatus according to one of the claims 8 to 11, characterized in that that end of the noses (51) that face the actuating element (78) is rounded off.
13. Apparatus according to one of the preceding claims, characterized in that the biasing of the noses (10,51) is variable.

14. Apparatus according to one of the preceding claims, characterized by a tapered element (13) that is disposed in the pin (1) and is movable counter to a biasing (15).
15. Apparatus according to claim 14, characterized in that the tapered element (13) is movable against a spring (15).
16. Apparatus according to one of the claims 14 or 15, characterized by a biasing element (12) disposed between the tapered element (13) and the noses (10).
17. Apparatus according to one of the claims 14 to 16, characterized in that the outwardly directed biasing of the noses is variable via a movement of the tapered element (13).
18. Apparatus according to one of the preceding claims, characterized by a tensioning element that draws the noses (10) inwardly, with a tensioning force that is not sufficient to overcome the normally outwardly directed biasing of the noses.
19. Apparatus according to claim 18, characterized in that the tensioning force of the tensioning element draws the noses (10) inwardly when the outwardly directed biasing is reduced.
20. Apparatus according to one of the claims 18 or 19, characterized in that the tensioning element is a spring ring disposed on the noses (1).

21. Apparatus according to claim 20, characterized in that the spring ring is disposed on the inner periphery of the noses (10).

22. - Apparatus according to one of the preceding claims, characterized by four noses (10,51).

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